

Claims:

1. A method of coding digital data for transmission according to a trellis coding system having a predetermined number of (N) states and a predetermined number of (M) state transitions from each state, wherein the data is arranged in a series of frames, a state is associated with each frame to determine a coding strategy for the frame, and a look-ahead depth (D) representing a number of data frames is selected, characterised by the step of:

assigning an initial state for a first frame of the series of data frames, and assigning states for the subsequent data frames in the series of data frames up to the look-ahead depth according to a predetermined valid trellis path, the method further including:

sequentially fetching subsequent data frames in the series and determining respective states therefor based on a path metric for state transitions computed over the number of frames represented by the look-ahead depth; and

coding the data frames for transmission according to the coding strategies corresponding to the states assigned or determined for the frames, wherein the series of data frames are coded for a shaped spectrum upon transmission thereof.

2. A method as claimed in claim 1, wherein fetched data frames are buffered over said look-ahead depth from a current frame X_i to a look-ahead depth frame X_{i+D} .

3. A method as claimed in claim 2, wherein node information for nodes representing possible state transitions at the look-ahead depth are stored in a node memory in an ordered array, and wherein the coding strategy for the current data frame X_i is determined on the basis of a node selected at the look-ahead depth according to said path metric.

4. A method as claimed in claim 3, wherein the node information in said node memory is replaced for each new data frame in the series.

5. A method as claimed in claim 3, wherein the coding strategy for the current data frame X_i is determined according to a state transition from the state associated with said current frame which is determined by a comparison of the position of the node selected at the look-ahead

depth with at least one predetermined threshold.

6. A data encoder for generating spectrally shaped coded data according to a trellis coding system, wherein the data is arranged in a series of data frames from a data source and a trellis state is associated with each data frame such that a coding scheme for each frame may be determined on the basis of transitions of states for frames over a selected look-ahead depth (D), comprising:

a buffer memory coupled to the data source for buffering data frames in the series of data frames by the selected look-ahead depth (D);

a metric computation and trellis extension engine coupled to sequentially receive said data frames from the data source and determine node information in a plurality of nodes for each said frame representing possible states, state transitions from a preceding frame and path metrics for the state transitions;

a current state storage coupled to the metric computation and trellis extension engine for storing the state of a current frame in the series of data frames;

a node memory coupled to the metric computation and trellis extension engine for storing said node information for nodes of a frame succeeding the current frame by the look-ahead depth;

a coding scheme memory for storing a correlation between state transitions and respective coding schemes; and

a processing circuit coupled to the coding scheme memory and metric computation and trellis extension engine for applying a selected coding scheme to a data frame to generate spectrally shaped coded data;

wherein said metric computation and trellis extension engine determines the selected coding scheme for the current frame according to the state stored in the current state storage and a node for the frame succeeding the current frame by the look-ahead depth which is selected on the basis of the path metric for the node, characterised by:

the metric computation and trellis extension engine assigning an initial state for a first frame of the series of data frames, and assigning states for the subsequent data frames in the series of data frames up to the look-ahead depth according to a predetermined valid trellis path.

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